

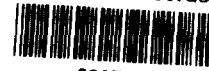


State of Ohio Environmental Protection Agency

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200715

George V. Voinovich
Governor

September 26, 1996

RE: OAC3745-300-08
GENERIC NUMERICAL
STANDARDS FOR
SOILS/GROUNDWATER

Ms. Linda Kern
Remedial Project Manager
US EPA, Region V
Mail Stop HSRM-6J
77 West Jackson Blvd.
Chicago IL 60604

Dear Ms. Kern:

Enclosed for review is a copy of the Proposed Ohio VAP Second Wave Rules that could be potentially be used as triggers for parameters lacking a MCL/RAL in ground water.

On a second matter, the list of Uniontown residents who have applied for a variance is somewhere in the Division of Public Drinking Water files. It was accidentally faxed to them for whatever reason. I am currently trying to locate it. As soon as I find it, you will be informed and receive a copy.

If you have any questions, please call me.

Sincerely,

Lawrence J. Antonelli
Site Coordinator
Division of Emergency and Remedial Response

LJA:ddb

enclosure

3745-300-08 GENERIC NUMERICAL STANDARDS.

(A) DEFINITIONS. AS USED IN THIS RULE:

- (1) "GENERIC DIRECT-CONTACT SOIL STANDARD" MEANS A GENERIC NUMERICAL STANDARD BASED ON AN EXPOSURE RESULTING FROM INGESTION OF SOIL, DERMAL CONTACT WITH SOIL OR INHALATION OF VOLATILE AND PARTICULATE EMISSIONS FROM SOIL.
- (2) "GENERIC NUMERICAL STANDARD" MEANS A CONCENTRATION OF A HAZARDOUS SUBSTANCE OR PETROLEUM THAT EXISTS ON A PROPERTY THAT ENSURES PROTECTION OF PUBLIC HEALTH AND SAFETY AND THE ENVIRONMENT FOR THE REASONABLE EXPOSURES ASSOCIATED WITH A RESIDENTIAL, COMMERCIAL OR INDUSTRIAL LAND USE OR POTABLE GROUND WATER USE. FOR PURPOSES OF THIS CHAPTER, GENERIC NUMERICAL STANDARDS INCLUDES STANDARDS FOR DIRECT-CONTACT SOILS, GROUND WATER AND SURFACE WATER.
- (3) "SUPPORT DOCUMENT FOR GENERIC STANDARDS" MEANS THE "SUPPORT DOCUMENT FOR THE DEVELOPMENT OF GENERIC NUMERICAL STANDARDS AND RISK ASSESSMENT PROCEDURES." JULY, 1996.

(B) GENERIC DIRECT-CONTACT SOIL STANDARDS.

(1) APPLICABILITY.

- (a) THE GENERIC DIRECT-CONTACT SOIL STANDARDS AT 3745-300-08 PARAGRAPH (B)(3) OF THIS RULE MAY APPLY TO A PROPERTY UNLESS ANY OF THE CIRCUMSTANCES IDENTIFIED IN PARAGRAPH (B)(1)(b) AND (B)(1)(c) OF THIS RULE APPLY.
- (b) A PROPERTY-SPECIFIC RISK ASSESSMENT MUST BE CONDUCTED FOLLOWING THE PROCEDURES ESTABLISHED IN THE RISK ASSESSMENT RULE TO DETERMINE APPLICABLE STANDARDS IN PLACE OF OR IN ADDITION TO USING THE GENERIC DIRECT-CONTACT SOIL STANDARDS IF ANY OF THE FOLLOWING APPLY TO THE PROPERTY:
 - (i) THE EXPOSURE PATHWAYS FOR THE INTENDED LAND USE, AS IDENTIFIED IN PARAGRAPH (H) OF THE PHASE II RULE, INCLUDE PATHWAYS THAT ARE NOT LISTED IN THE SUPPORT DOCUMENT FOR GENERIC STANDARDS

- FOR THAT INTENDED LAND USE;
- (ii) THE EXPOSURE FACTORS FOR THE INTENDED LAND USE INCLUDE EXPOSURE FACTOR VALUES NOT LISTED IN THE SUPPORT DOCUMENT FOR GENERIC STANDARDS OR RECEPTOR POPULATIONS THAT ARE NOT LISTED IN PARAGRAPH (B)(2)(c) OF THIS RULE;
 - (iii) THE CHEMICAL(S) OF CONCERN ARE NOT INCLUDED IN PARAGRAPH (B)(3) OF THIS RULE. IF ONLY SOME OF THE CHEMICAL(S) OF CONCERN IDENTIFIED HAVE A GENERIC DIRECT-CONTACT SOIL STANDARD VALUE LISTED IN PARAGRAPH (B)(3) OF THIS RULE, A VOLUNTEER MAY USE THE APPLICABLE GENERIC DIRECT-CONTACT SOIL STANDARDS, AND, FOR THE CHEMICAL(S) OF CONCERN WHICH DO NOT HAVE GENERIC DIRECT-CONTACT SOIL STANDARDS, DETERMINE AN APPLICABLE STANDARD FOLLOWING THE RISK ASSESSMENT PROCEDURES CONTAINED IN THE RISK ASSESSMENT RULE. WHEN USING A COMBINATION OF GENERIC DIRECT-CONTACT SOIL STANDARDS AND APPLICABLE STANDARDS, DETERMINED BY A RISK ASSESSMENT, THE VOLUNTEER MUST ADJUST THE CONCENTRATIONS OF THE APPLICABLE STANDARDS, USING THE PROCEDURES CONTAINED IN PARAGRAPH (B)(2)(b) OF THIS RULE TO MEET THE HUMAN HEALTH RISK BASED LEVELS DESCRIBED IN PARAGRAPHS (B)(2)(a) OF THIS RULE;
 - (iv) ENGINEERING CONTROLS OR INSTITUTIONAL CONTROLS ARE USED TO MEET APPLICABLE STANDARDS, OTHER THAN THE INDUSTRIAL AND COMMERCIAL LAND USE RESTRICTIONS CONTAINED IN PARAGRAPH (B)(2)(c) OF THIS RULE;
 - (v) IT IS DETERMINED, AS A RESULT OF A PHASE II PROPERTY ASSESSMENT CONDUCTED IN ACCORDANCE WITH THE PHASE II RULE, THAT IMPORTANT ECOLOGICAL RESOURCES OR SEDIMENTS ARE IMPACTED BY HAZARDOUS SUBSTANCES OR PETROLEUM.
 - (vi) IT IS DETERMINED, AS A RESULT OF A PHASE II PROPERTY ASSESSMENT CONDUCTED IN ACCORDANCE

WITH PARAGRAPH (H)(6) OF THE PHASE II RULE, THAT HAZARDOUS SUBSTANCES OR PETROLEUM ARE LEACHING OR WILL LEACH TO GROUND WATER AND LEACHING OF HAZARDOUS SUBSTANCES OR PETROLEUM TO GROUND WATER UNDERLYING OR EMANATING FROM THE PROPERTY IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH THE GROUNDWATER CLASSIFICATION RULE.

- (c) IF IT IS DETERMINED, AS A RESULT OF A PHASE II PROPERTY ASSESSMENT CONDUCTED FOLLOWING PARAGRAPHS (F)(1)(c) AND (D)(6) OF THE PHASE II RULE, THAT RADIOACTIVE MATERIALS ARE IDENTIFIED AT A PROPERTY THE VOLUNTEER MUST COMPLY WITH THE "ATOMIC ENERGY ACT OF 1954," 68 STAT. 919, 42 U.S.C.A. 2011, AS AMENDED, AND REGULATIONS ADOPTED THEREUNDER AND CHAPTERS 3701. OR 3747. OF THE REVISED CODE AND RULES ADOPTED THEREUNDER.
- (d) IF THE GENERIC DIRECT-CONTACT SOIL STANDARDS, LISTED IN PARAGRAPH (B)(3) OF THIS RULE ARE APPLIED TO ONE OR MORE IDENTIFIED AREAS OF THE PROPERTY AND APPLICABLE STANDARDS ARE APPLIED TO ONE OR MORE OTHER AREAS OF THE PROPERTY AS DETERMINED FOLLOWING THE RISK ASSESSMENT RULE, THEN THE VOLUNTEER MUST ENSURE THAT THE RISKS FOR THE PROPERTY DO NOT EXCEED:
 - (i) ONE EXCESS CANCER IN A POPULATION OF 100,000 (1×10^{-5}); AND
 - (ii) A HAZARD INDEX OF 1.
- (2) ASSUMPTIONS.
 - (a) SINGLE CHEMICAL.

THE GENERIC DIRECT-CONTACT SOIL STANDARDS PRESENTED IN PARAGRAPH (B)(3) OF THIS RULE ASSUME A SINGLE CHEMICAL OF CONCERN IS PRESENT ON A PROPERTY.

- (i) THE GENERIC DIRECT-CONTACT SOIL STANDARDS SET FORTH IN PARAGRAPH (B)(3) OF THIS RULE ARE BASED

ON THE FOLLOWING:

- (A) FOR HAZARDOUS SUBSTANCES HAVING CARCINOGENIC EFFECTS, THE CHEMICAL-SPECIFIC CARCINOGENIC RISK MUST NOT EXCEED ONE EXCESS CANCER IN A POPULATION OF 100,000 (I.E. 1×10^{-5}); AND
 - (B) FOR HAZARDOUS SUBSTANCES HAVING NONCARCINOGENIC EFFECTS, THE CHEMICAL-SPECIFIC RISK MUST NOT EXCEED A HAZARD INDEX OF 1.
- (ii) THE NINETY-FIVE PER CENT UPPER CONFIDENCE LIMIT OR MAXIMUM CONCENTRATION, AS DETERMINED IN ACCORDANCE WITH PARAGRAPH (G)(4) OF THE PHASE II RULE, MUST NOT EXCEED THE SINGLE CHEMICAL GENERIC DIRECT-CONTACT SOIL STANDARD.
- (b) MULTIPLE CHEMICALS.

WHEN MORE THAN ONE CHEMICAL OF CONCERN IS PRESENT ON A PROPERTY AND AN APPLICABLE GENERIC DIRECT-CONTACT SOIL STANDARD FOR EACH OF THE CHEMICAL(S) OF CONCERN ARE CONTAINED IN SUBPARAGRAPHS (C)(3)(a)(ii), (C)(3)(c), (C)(3)(d) OR (C)(3)(e) OF THIS PARAGRAPH, THE CONCENTRATIONS MUST BE ADJUSTED TO MEET THE HUMAN HEALTH RISK BASED LEVELS DESCRIBED IN SUBPARAGRAPH (2)(a) OF THIS PARAGRAPH, USING THE PROCEDURE AND EQUATIONS IN THIS PARAGRAPH. THE SAME CUMULATIVE ADJUSTMENT DESCRIBED ABOVE MUST BE MADE WHEN USING A COMBINATION OF GENERIC DIRECT-CONTACT STANDARDS AND APPLICABLE STANDARDS AS DETERMINED BY A RISK ASSESSMENT. THE CUMULATIVE ADJUSTMENT MUST BE MADE AS FOLLOWS:

- (i) FOR CANCER RISK ESTIMATES: DIVIDE THE MAXIMUM OR 95 PER CENT UPPER CONFIDENCE LIMIT CONCENTRATION OF EACH CARCINOGENIC CHEMICAL OF CONCERN ON THE PROPERTY [CHEM_x], AS DETERMINED IN ACCORDANCE WITH PARAGRAPH (G)(4) OF THE PHASE II RULE, BY THE APPROPRIATE

CHEMICAL CONCENTRATION THAT IS LISTED IN THE "SINGLE CHEMICAL CARCINOGEN" COLUMN CONTAINED IN PARAGRAPH (B)(3) OF THIS RULE. THE CUMULATIVE CANCER RISK FOR ALL THE CARCINOGENIC CHEMICAL(S) OF CONCERN IDENTIFIED AT THE PROPERTY MUST NOT EXCEED 1×10^{-5} . IF THE CUMULATIVE CANCER RISK AS CALCULATED IN THE EQUATION BELOW EXCEEDS 1×10^{-5} , THEN THE DIRECT-CONTACT SOIL STANDARD FOR EACH CARCINOGEN MUST BE DERIVED BY ADJUSTING EACH SINGLE CHEMICAL DIRECT-CONTACT SOIL STANDARD DOWNWARD AS NECESSARY. SO THAT THE SUM OF THE RATIOS IN THIS EQUATION DOES NOT EXCEED ONE, ALL CARCINOGENIC CHEMICAL(S) OF CONCERN IDENTIFIED AT A PROPERTY MUST BE INCLUDED IN THIS EQUATION:

$$\left(\frac{[chem_a]}{GCS_a} + \frac{[chem_b]}{GCS_b} + \dots \right) \leq 1 \text{ (cumulative cancer risk of } 1 \times 10^{-5} \text{)}$$

WHERE "GCS" MEANS GENERIC DIRECT-CONTACT SOIL STANDARD THAT IS LISTED IN THE "SINGLE CHEMICAL CARCINOGEN" COLUMN IN PARAGRAPH (B)(3) OF THIS RULE. THE APPLICABLE STANDARD FOR EACH CARCINOGEN WILL BE THE LOWEST OF THE VALUES REPRESENTING THE ADJUSTED SINGLE CHEMICAL CARCINOGEN CONCENTRATION OR, IF APPROPRIATE, THE SOIL SATURATION CONCENTRATION.

- (ii) FOR NONCARCINOGENIC HAZARD INDEX ESTIMATES: DIVIDE THE MAXIMUM OR 95 PER CENT UPPER CONFIDENCE LIMIT CONCENTRATION OF EACH NONCARCINOGENIC CHEMICAL OF CONCERN ON THE PROPERTY $[CHEM_x]$, AS DETERMINED IN ACCORDANCE WITH PARAGRAPH (G)(4) OF THE PHASE II RULE, BY THE APPROPRIATE CHEMICAL CONCENTRATION THAT IS LISTED IN THE "SINGLE CHEMICAL NONCARCINOGEN" COLUMN CONTAINED IN SUBPARAGRAPH (3) OF THIS PARAGRAPH. THE CUMULATIVE NONCANCER RISK FOR ALL THE NONCARCINOGENIC CHEMICAL(S) OF CONCERN IDENTIFIED AT THE PROPERTY MUST NOT

EXCEED 1. IF THE CUMULATIVE NONCANCER RISK, AS CALCULATED IN THE EQUATION BELOW EXCEEDS 1, THEN THE DIRECT-CONTACT SOIL STANDARD FOR EACH NONCARCINOGEN MUST BE DERIVED BY ADJUSTING EACH SINGLE CHEMICAL DIRECT-CONTACT SOIL STANDARD DOWNWARD, SO THAT THE SUM OF THE RATIOS IN THIS EQUATION DOES NOT EXCEED ONE. ALL NONCARCINOGENIC CHEMICAL(S) OF CONCERN IDENTIFIED FOR THE PROPERTY MUST BE INCLUDED IN THIS EQUATION:

$$\left(\frac{[chem_a]}{GNCS_a} + \frac{[chem_b]}{GNCS_b} + \dots \right) \leq 1.0 \text{ (a hazard index of 1.0)}$$

WHERE “GNCS” MEANS THE GENERIC DIRECT SOIL CONTACT STANDARD THAT IS LISTED IN THE “SINGLE CHEMICAL NONCARCINOGEN” COLUMN IN SUBPARAGRAPH (3) OF THIS PARAGRAPH. THE APPLICABLE STANDARD FOR EACH NONCARCINOGEN WILL BE THE LOWEST OF THE VALUES REPRESENTING THE ADJUSTED SINGLE CHEMICAL NONCARCINOGEN CONCENTRATION OR, IF APPROPRIATE, THE SOIL SATURATION CONCENTRATION.

- (iii) FOR SITUATIONS WHERE A CHEMICAL OF CONCERN POSES BOTH CARCINOGENIC AND NONCARCINOGENIC RISK AND HAS A CHEMICAL CONCENTRATION LISTED IN BOTH THE “SINGLE CHEMICAL CARCINOGEN” COLUMN AND THE “SINGLE CHEMICAL NONCARCINOGEN” COLUMN CONTAINED IN SUBPARAGRAPH (3) OF THIS PARAGRAPH, THE CHEMICAL OF CONCERN MUST BE EVALUATED IN THE MULTIPLE CARCINOGENIC CHEMICAL ADJUSTMENT CALCULATION UNDER SUBPARAGRAPH (2)(B)(i) OF THIS PARAGRAPH AND THE MULTIPLE NONCARCINOGENIC CHEMICAL ADJUSTMENT CALCULATION UNDER SUBPARAGRAPH (2)(B)(ii) OF THIS PARAGRAPH. THE APPLICABLE STANDARD FOR THE CHEMICAL OF CONCERN WILL BE THE LOWEST CONCENTRATION DETERMINED BY USING THE EQUATIONS IN THIS PARAGRAPH, OR THE SOIL SATURATION

CONCENTRATION IF APPROPRIATE.

(c) LAND USE CATEGORIES.

THE GENERIC DIRECT-CONTACT SOIL STANDARDS ESTABLISHED IN THIS RULE ARE BASED UPON THE INTENDED USE OF THE PROPERTY AFTER THE COMPLETION OF A VOLUNTARY ACTION. LAND USE MUST BE DETERMINED ACCORDING TO THE CATEGORIES LISTED BELOW:

(i) RESIDENTIAL LAND USE CATEGORY.

RESIDENTIAL LAND USE IS LAND USE WITH A HIGH FREQUENCY OF POTENTIAL EXPOSURE OF ADULTS AND CHILDREN TO DERMAL CONTACT WITH SOIL, INHALATION OF VAPORS AND PARTICLES FROM SOIL AND INGESTION OF SOIL. THE CURRENT OR INTENDED USES OF THE PROPERTY INCLUDES, BUT IS NOT LIMITED TO HOUSING, EDUCATION, OR LONG-TERM HEALTH CARE FOR ADULTS, CHILDREN, THE ELDERLY, OR THE INFIRM, WHERE EXPOSURE ROUTES TO SOIL FROM THE PROPERTY ARE REASONABLY ANTICIPATED TO EXIST. EXAMPLES OF RESIDENTIAL LAND USES INCLUDE, BUT ARE NOT LIMITED TO: RESIDENCES; DAY CARE FACILITIES; SCHOOLS, COLLEGES AND OTHER EDUCATIONAL INSTITUTIONS; NURSING HOMES, ELDER CARE AND OTHER LONG-TERM HEALTH CARE FACILITIES; AND CORRECTIONAL FACILITIES.

[COMMENT: THE EXPOSURE FACTOR DISTRIBUTIONS USED TO CALCULATE THE GENERIC DIRECT-CONTACT SOIL STANDARDS FOR RESIDENTIAL LAND USE ARE CONTAINED IN THE SUPPORT DOCUMENT FOR GENERIC STANDARDS.]

(ii) COMMERCIAL LAND USE CATEGORY.

COMMERCIAL LAND USE IS LAND USE WITH POTENTIAL EXPOSURE OF ADULT WORKERS DURING A BUSINESS DAY AND POTENTIAL EXPOSURES OF ADULTS AND CHILDREN WHO ARE CUSTOMERS, PATRONS OR VISITORS TO SUCH FACILITIES. COMMERCIAL LAND USE INCLUDES POTENTIAL EXPOSURE OF ADULTS TO

DERMAL CONTACT WITH SOIL, INHALATION OF VAPORS AND PARTICLES FROM SOIL AND INGESTION OF SOIL. EXPOSURES TO SOIL ON THE PROPERTY MUST BE SHORT AND INFREQUENT. THE CURRENT OR INTENDED USE OF THE PROPERTY INCLUDES, BUT IS NOT LIMITED TO FACILITIES WHICH SUPPLY GOODS OR SERVICES AND ARE OPEN TO THE PUBLIC. EXAMPLES OF COMMERCIAL LAND USES INCLUDE, BUT ARE NOT LIMITED TO: WAREHOUSES; BUILDING SUPPLY FACILITIES; RETAIL GASOLINE STATIONS; AUTOMOBILE SERVICE STATIONS; AUTOMOBILE DEALERSHIPS; RETAIL WAREHOUSES; REPAIR AND SERVICE ESTABLISHMENTS FOR APPLIANCES AND OTHER GOODS, PROFESSIONAL OFFICES; BANKS AND CREDIT UNIONS; OFFICE BUILDINGS; RETAIL BUSINESSES SELLING FOOD OR MERCHANDISE; HOSPITALS AND CLINICS; RELIGIOUS INSTITUTIONS; HOTELS; MOTELS; PERSONAL SERVICE ESTABLISHMENTS; AND PARKING FACILITIES.

[COMMENT: THE EXPOSURE FACTOR DISTRIBUTIONS USED TO CALCULATE THE GENERIC DIRECT-CONTACT SOIL STANDARDS FOR COMMERCIAL LAND USE ARE CONTAINED IN THE SUPPORT DOCUMENT FOR GENERIC STANDARDS.]

(iii) INDUSTRIAL LAND USE CATEGORY.

INDUSTRIAL LAND USE IS LAND USE WITH EXPOSURE OF ADULT WORKERS DURING A BUSINESS DAY. INDUSTRIAL LAND USE MUST RELIABLY EXCLUDE THE GENERAL PUBLIC AND CHILDREN FROM ACCESS TO THE FACILITY. INDUSTRIAL LAND USE INVOLVES POTENTIAL EXPOSURE OF ADULTS TO DERMAL CONTACT WITH SOIL, INHALATION OF VAPORS AND PARTICLES FROM SOIL AND INGESTION OF SOIL. THE CURRENT OR INTENDED USE FOR THE PROPERTY INCLUDES, BUT IS NOT LIMITED TO, TRANSPORTATION OR THE MANUFACTURE OR ASSEMBLY OF GOODS SUCH AS PARTS, MACHINES OR CHEMICALS. EXAMPLES OF INDUSTRIAL LAND USES INCLUDE, BUT ARE NOT LIMITED TO: LUMBERYARDS; POWER PLANTS, MANUFACTURING FACILITIES SUCH AS METAL-

WORKING SHOPS, PLATING SHOPS, BLAST FURNACES, COKE PLANTS, OIL REFINERIES, BRICK FACTORIES, CHEMICAL PLANTS AND PLASTICS PLANTS; ASSEMBLY PLANTS; NON-PUBLIC AIRPORT AREAS; LIMITED ACCESS HIGHWAYS; RAILROAD SWITCHING YARDS AND MARINE PORT FACILITIES.

[COMMENT: THE EXPOSURE FACTOR DISTRIBUTIONS USED TO CALCULATE THE GENERIC DIRECT-CONTACT SOIL STANDARDS FOR INDUSTRIAL LAND USE ARE CONTAINED IN THE SUPPORT DOCUMENT FOR GENERIC STANDARDS.]

(d) POINT OF COMPLIANCE.

A VOLUNTEER, OR OWNER IF DIFFERENT FROM THE VOLUNTEER, MUST MEET AND MAINTAIN COMPLIANCE WITH THE APPLICABLE GENERIC DIRECT-CONTACT STANDARDS TO A DEPTH WHERE IT IS REASONABLY ANTICIPATED THAT SURFICIAL SOILS WILL BE MADE AVAILABLE FOR DIRECT-CONTACT THROUGH EXCAVATION, GRADING, DRILLING OR OTHER CIRCUMSTANCES. THE FOLLOWING MINIMUM SOIL DEPTHS TO WHICH THE GENERIC DIRECT-CONTACT SOIL STANDARDS APPLY ARE AS FOLLOWS:

- (i) FOR THE RESIDENTIAL LAND USE CATEGORY, THE GENERIC DIRECT-CONTACT SOIL STANDARDS LISTED IN PARAGRAPH (B)(3) OF THIS RULE APPLY TO CHEMICAL(S) OF CONCERN THAT ARE PRESENT IN SOILS FROM THE SURFACE TO A MINIMUM DEPTH OF TEN FEET. THE VOLUNTEER OR OWNER, IF DIFFERENT FROM THE VOLUNTEER, MUST COMPLY WITH GENERIC DIRECT-CONTACT SOIL STANDARDS AT DEPTHS BELOW TEN FEET WHEN IT IS REASONABLY ANTICIPATED THAT SOILS WILL BE MADE AVAILABLE FOR DIRECT-CONTACT THROUGH EXCAVATION, GRADING, DRILLING OR OTHER CIRCUMSTANCES.
- (ii) FOR BOTH THE COMMERCIAL AND INDUSTRIAL LAND USE CATEGORIES, THE GENERIC DIRECT-CONTACT SOIL STANDARDS LISTED IN PARAGRAPH (B)(3) OF THIS RULE APPLY TO CHEMICAL(S) OF CONCERN IN THE SOILS

FROM THE SURFACE TO A MINIMUM DEPTH OF TWO FEET. THE VOLUNTEER OR OWNER, IF DIFFERENT FROM THE VOLUNTEER, MUST COMPLY WITH GENERIC DIRECT-CONTACT SOIL STANDARDS AT DEPTHS BELOW TWO FEET WHEN IT IS REASONABLY ANTICIPATED THAT SOILS WILL BE MADE AVAILABLE FOR DIRECT-CONTACT THROUGH EXCAVATION, GRADING, DRILLING OR OTHER CIRCUMSTANCES.

[COMMENT: THE POINT OF COMPLIANCE FOR SOILS ON A PROPERTY IS A MINIMUM OF TWO FEET FOR INDUSTRIAL AND COMMERCIAL PROPERTY AND A MINIMUM OF TEN FEET FOR RESIDENTIAL PROPERTY. THE NO FURTHER ACTION LETTER AND ANY COVENANT NOT TO SUE ISSUED FOR A PROPERTY MUST SPECIFY THE APPROPRIATE POINT OF COMPLIANCE. OWNERS, OPERATORS, EMPLOYEES, RESIDENTS, POTENTIAL PURCHASERS OR OTHER PERSONS WHO MAY USE THE PROPERTY SHOULD BE AWARE THAT SOILS BELOW THESE MINIMUM DEPTHS OF COMPLIANCE HAVE NOT NECESSARILY BEEN CHARACTERIZED AND DETERMINED TO MEET GENERIC DIRECT-CONTACT SOIL STANDARDS EVEN THOUGH A VOLUNTARY ACTION HAS BEEN COMPLETED AT THE PROPERTY.]

(3) GENERIC DIRECT-CONTACT SOIL STANDARDS.

(a) PETROLEUM STANDARDS.

(i) RESIDENTIAL OR COMMERCIAL LAND USE PETROLEUM STANDARDS.

THE GENERIC DIRECT-CONTACT SOIL STANDARDS FOR PETROLEUM AT COMMERCIAL OR RESIDENTIAL PROPERTIES WILL BE THE STANDARDS ESTABLISHED IN THE RULES ADOPTED UNDER DIVISION (B) OF SECTIONS 3737.88 AND 3737.882 OF THE REVISED CODE WHICH ARE CURRENTLY SET FORTH IN CHAPTER 1301:7-9-13 OF THE ADMINISTRATIVE CODE.

(ii) INDUSTRIAL LAND USE PETROLEUM STANDARDS.

THE GENERIC DIRECT-CONTACT SOIL STANDARDS FOR TOTAL PETROLEUM HYDROCARBONS AT INDUSTRIAL PROPERTIES MUST BE DETERMINED BY THE FOLLOWING METHOD:

- (A) IF THE TOTAL PETROLEUM HYDROCARBONS IN THE SOILS ON THE PROPERTY COME FROM LIGHT PETROLEUM FRACTIONS, SUCH AS NATURAL GASOLINE, GASOHOL AND NAPHTHA SOLVENTS, THE SOILS ON THE PROPERTY MUST BE ANALYZED FOR *N*-HEXANE, BENZENE, TOLUENE, ETHYLBENZENE, TOTAL XYLENES, AND LEAD. THE SOILS ON THE PROPERTY MUST MEET THE GENERIC DIRECT-CONTACT SOIL STANDARDS, LISTED IN TABLE IV OF THIS RULE, FOR THE ABOVE CHEMICALS. IN ADDITION, THE TOTAL PETROLEUM HYDROCARBON CONCENTRATION IN THE SOILS ON THE PROPERTY MUST NOT EXCEED THE RESIDUAL SOIL SATURATION CONCENTRATION LISTED IN TABLE I BELOW FOR THE PROPERTY-SPECIFIC SOIL TYPE AND PETROLEUM FRACTION; OR
- (B) IF THE TOTAL PETROLEUM HYDROCARBONS IN THE SOILS ON THE PROPERTY COME FROM MIDDLE PETROLEUM FRACTIONS, SUCH AS KEROSENE, DIESEL FUEL AND JET FUEL, THE SOILS ON THE PROPERTY MUST BE ANALYZED FOR BENZENE, TOLUENE, ETHYLBENZENE, TOTAL XYLENES, NAPHTHALENE, BENZO[A]ANTHRACENE, BENZO[B]FLUORANTHENE, BENZO[K]FLUORANTHENE, CHRYSENE, DIBENZO[A,H]ANTHRACENE, INDENO[1,2,3-CD]PYRENE, ACENAPHTHENE, ANTHRACENE, FLUORANTHENE, FLUORENE AND PYRENE. THE SOILS ON THE PROPERTY MUST MEET THE GENERIC DIRECT-CONTACT SOIL STANDARDS, LISTED IN TABLE IV OF THIS RULE, FOR THE ABOVE CHEMICALS. IN ADDITION, THE TOTAL PETROLEUM HYDROCARBON CONCENTRATION IN THE SOILS ON THE PROPERTY MUST NOT EXCEED THE RESIDUAL SATURATION

CONCENTRATION LISTED IN TABLE I BELOW FOR THE PROPERTY-SPECIFIC SOIL TYPE AND PETROLEUM FRACTION; OR

- (C) IF THE TOTAL PETROLEUM HYDROCARBONS IN THE SOILS ON THE PROPERTY COME FROM HEAVY PETROLEUM FRACTIONS, SUCH AS HYDRAULIC OIL, LUBE OIL, AND RESIDUAL FUEL OILS, THE SOILS ON THE PROPERTY MUST BE ANALYZED FOR BENZO[A]ANTHRACENE, BENZO[B]FLUORANTHENE, BENZO[K]FLOURANTHENE, CHRYSENE, DIBENZO[A,H]ANTHRACENE, INDENO[1,2,3-CD]PYRENE, ACENAPHTHENE, ANTHRACENE, FLOURANTHENE, FLUORENE AND PYRENE. THE SOILS ON THE PROPERTY MUST MEET THE GENERIC DIRECT-CONTACT SOIL STANDARDS, LISTED IN TABLE IV OF THIS RULE, FOR THE ABOVE CHEMICALS. IN ADDITION, THE TOTAL PETROLEUM HYDROCARBON CONCENTRATION IN THE SOILS ON THE PROPERTY MUST NOT EXCEED THE RESIDUAL SATURATION CONCENTRATION LISTED IN TABLE I BELOW FOR THE PROPERTY-SPECIFIC SOIL TYPE AND PETROLEUM FRACTION.
- (D) IF THE TOTAL PETROLEUM HYDROCARBONS IN THE SOILS ON THE PROPERTY COME FROM AN UNKNOWN SOURCE, OR FROM AN AGGREGATE OF TWO OR MORE OF THE SOURCE FRACTIONS, THE SOILS ON THE PROPERTY MUST BE ANALYZED FOR BENZENE, ETHYLBENZENE, TOLUENE, TOTAL XYLENES, LEAD, *N*-HEXANE, NAPHTHALENE, BENZO[A]ANTHRACENE, BENZO[B]FLUORANTHENE, BENZO[K]FLOURANTHENE, CHRYSENE, DIBENZO[A,H]ANTHRACENE, INDENO[1,2,3-CD]PYRENE, ACENAPHTHENE, ANTHRACENE, FLOURANTHENE, FLUORENE AND PYRENE. THE SOILS ON THE PROPERTY MUST MEET THE GENERIC DIRECT-CONTACT SOIL STANDARDS, LISTED IN TABLE IV OF THIS RULE, FOR THE ABOVE CHEMICALS. IN ADDITION, THE TOTAL

PETROLEUM HYDROCARBON CONCENTRATION IN THE SOILS ON THE PROPERTY MUST NOT EXCEED THE RESIDUAL SATURATION CONCENTRATION LISTED IN TABLE I BELOW FOR THE PROPERTY-SPECIFIC SOIL TYPE AND THE LIGHTEST PETROLEUM FRACTION PRESENT ON THE PROPERTY.

- (E) THE TOTAL PETROLEUM HYDROCARBON SATURATION CONCENTRATIONS MUST BE DETERMINED FOR THE INDUSTRIAL PROPERTY BY DETERMINING THE VERTICAL HYDRAULIC CONDUCTIVITY OF THE UNSATURATED SOIL AND APPLYING THE RESIDUAL SATURATION CONCENTRATION, CONTAINED IN TABLE I BELOW THAT CORRESPONDS TO THE PROPERTY - SPECIFIC PETROLEUM FRACTION. THE RESIDUAL SATURATION CONCENTRATIONS CONTAINED IN TABLE I BELOW ARE BASED ON RESIDUAL SOIL SATURATION WITH ADDITIONAL CONSIDERATION FOR THE TOXICITY OF THE UNCHARACTERIZED PORTION OF TOTAL PETROLEUM HYDROCARBON.

[COMMENT: FOR EXAMPLE, IF THE SOURCE OF PETROLEUM CONTAMINATION IS FROM A LIGHT PETROLEUM FRACTION, SUCH AS GASOLINE, AND THE SOILS ON THE PROPERTY ARE DETERMINED TO HAVE A VERTICAL HYDRAULIC CONDUCTIVITY (K_v) OF 10^{-3} CM/S THEN, IN ADDITION TO MEETING THE INDUSTRIAL GENERIC DIRECT-CONTACT SOIL STANDARDS FOR BENZENE, ETHYLBENZENE, TOLUENE, TOTAL XYLENES AND N-HEXANE, THE TOTAL PETROLEUM HYDROCARBON CONCENTRATION MUST NOT EXCEED ONE THOUSAND MG/KG.]

TABLE I: TOTAL PETROLEUM HYDROCARBON SOIL SATURATION CONCENTRATION (VALUES ARE IN MG/KG).

SOIL PERMEABILITY			
PETROLEUM FRACTION	RESIDUAL SATURATION CONCENTRATIONS FOR:	RESIDUAL SATURATION CONCENTRATIONS FOR:	RESIDUAL SATURATION CONCENTRATIONS FOR:
	SAND AND GRAVEL; UNKNOWN SOIL TYPE	SILTY/CLAYEY SAND	GLACIAL TILL AND SILTY CLAY
	$K_v: 10^{-3} - 10^{-4}$ CM/S	$K_v: 10^{-4} - 10^{-5}$ CM/S	$K_v: < 10^{-5}$ CM/S
LIGHT (C_4 - C_{12})	1,000	5,000	8,000
MIDDLE (C_7 - C_{16})	2,000	10,000	20,000
HEAVY (C_{16} - C_{32})	5,000	20,000	40,000

WHERE: "MG/KG" MEANS MILLIGRAMS PER KILOGRAM, " K_v " MEANS VERTICAL HYDRAULIC CONDUCTIVITY OF THE UNSATURATED SOIL, "CM/S" MEANS CENTIMETERS PER SECOND, AND " C_x " MEANS CARBON CHAIN LENGTH.

(b) REPORTING LIMITS FOR CERTIFIED LABORATORIES.

THE VOLUNTEER MUST DETERMINE THAT THE CERTIFIED LABORATORY, WHICH PERFORMS ANALYSES THAT FORM THE BASIS FOR THE ISSUANCE OF A FURTHER ACTION LETTER, IS CAPABLE OF DETECTING THE CHEMICAL(S) OF CONCERN ON THE PROPERTY AT OR BELOW THE APPLICABLE GENERIC DIRECT-CONTACT SOIL STANDARDS. THE VOLUNTEER SHOULD CONTACT THE CERTIFIED LABORATORY THAT IS CONDUCTING ANALYSES IN SUPPORT OF THE VOLUNTARY ACTION TO DETERMINE IF THE CLEANUP STANDARDS CONTAINED IN SUBPARAGRAPH (3) OF THIS PARAGRAPH ARE WITHIN THE LABORATORY'S REPORTING LIMITS. IN ADDITION, THE VOLUNTEER SHOULD BE AWARE THAT EVEN IF THE STANDARDS CONTAINED IN SUBPARAGRAPH (3) OF THIS PARAGRAPH ARE WITHIN THE CERTIFIED LABORATORY'S REPORTING LIMITS, THE ACTUAL CLEANUP LEVELS THAT MUST BE MET AT A PROPERTY MAY BE LOWER IF MULTIPLE CHEMICALS OF CONCERN EXIST AT THE PROPERTY. PROPERTIES WITH MULTIPLE CHEMICALS OF

CONCERN MUST PERFORM A CUMULATIVE ADJUSTMENT FOLLOWING THE PROCEDURE CONTAINED IN SUBPARAGRAPH (2)(b) OF THIS PARAGRAPH. THE VOLUNTEER MUST ENSURE THAT THE CLEANUP LEVELS AFTER PERFORMING THIS CUMULATIVE ADJUSTMENT, ARE NOT BELOW THE CERTIFIED LABORATORY'S REPORTING LIMITS.

(c) **TABLE II: GENERIC DIRECT-CONTACT SOIL STANDARDS FOR CARCINOGENIC AND NONCARCINOGENIC CHEMICALS OF CONCERN - RESIDENTIAL LAND USE CATEGORY (VALUES ARE IN MG/KG).**

	SINGLE CHEMICAL NONCARCINOGEN	SINGLE CHEMICAL CARCINOGENS	SOIL SATURATION *	SINGLE CHEMICAL CLEANUP STANDARD
VOLATILE ORGANIC CHEMICALS				
Acetone	2600		62000	2600
Benzene	2.6	6.8	1600	2.6
Carbon Tetrachloride	0.76	2.9	2500	0.76
1,1 Dichloroethane	160		2600	160
1,2 Dichloroethane	4.8	2.4	2300	2.4
1,1 Dichloroethene	7.2	0.57	3000	0.57
trans-1,2 Dichloroethene	30		6400	30
cis-1,2 Dichloroethene	14		2600	14
Ethylbenzene	890		1200	890
n-Hexane	29		200	29
Methylene Chloride	660	70	3800	70
Methyl Ethyl Ketone	1900		27000	1900
Methyl Iso-Butyl Ketone	120		3800	120
Styrene	1300		1200	1200
Tetrachloroethene (PCE)	17	26	630	17
Toluene	310		1800	310
1,1,1-Trichloroethane	340		2200	340
Trichloroethene (TCE)	12	40	3500	12
Vinyl Chloride		0.15	2500	0.15
Total Xylenes	400		1500	400
SEMI-VOLATILE ORGANIC COMPOUNDS				
Acenaphthene	1400			1400
Anthracene	9000			9000
Benzo(a)anthracene		2.8		2.8
Benzo(b)fluoranthene		2.8		2.8
Benzo(k)fluoranthene		2.8		2.8
Benzo(a)pyrene		0.28		0.28
Bis (2-ethylhexyl) phthala	360	75	36000	75
Chrysene		280		280
Dibenzo(a,h)anthracene		0.28		0.28
Fluoranthene	1200			1200
Fluorene	1000			1000
Indeno(1,2,3-cd)pyrene		2.8		2.8
Naphthalene	700			700
Phenol	25000			25000
Pyrene	900			900
INORGANIC COMPOUNDS				
Arsenic	21	6.6		6.6
Barium	4700			4700
Cadmium	15	12000		15
Chromium(III)	310			310
Chromium(VI)	220	1800		220
Mercury	16			16
Nickel (soluble salts)	420			420
Zinc	19000			19000

(d) **TABLE III: GENERIC DIRECT-CONTACT SOIL STANDARDS FOR CARCINOGENIC AND NONCARCINOGENIC CHEMICALS OF CONCERN - COMMERCIAL LAND USE CATEGORY**

CHEMICAL OF CONCERN	SINGLE CHEMICAL NONCARCINOGENS	SINGLE CHEMICAL CARCINOGENS	SOIL SATURATION *	SINGLE CHEMICAL CLEANUP STANDARD
VOLATILE ORGANIC CHEMICALS				
Acetone	14000		62000	14000
Benzene	130	120	1600	120
Carbon Tetrachloride	30	39	2500	30
1,1 Dichloroethane	6000		2600	2600
1,2 Dichloroethane	240	42	2300	42
1,1 Dichloroethene	320	8.4	3000	8.4
trans-1,2 Dichloroethene	1100		6400	1100
cis-1,2 Dichloroethene	530		2600	530
Ethylbenzene	12000		1200	1200
n-Hexane	1300		200	200
Methylene Chloride	7500	850	3800	850
Methyl Ethyl Ketone	52000		27000	27000
Methyl Iso-Butyl Ketone	4500		3800	3800
Styrene	22000		1200	1200
Tetrachloroethene (PCE)	600	180	630	180
Toluene	12000		1800	1800
1,1,1-Trichloroethane	8400		2200	2200
Trichloroethene (TCE)	410	530	3500	410
Vinyl Chloride		2.4	2500	2.4
Total Xylenes	20000		1500	1500
SEMI-VOLATILE ORGANIC COMPOUNDS				
Acenaphthene	10000			10000
Anthracene	52000			52000
Benzo(a)anthracene		17		17
Benzo(b)fluoranthene		17		17
Benzo(k)fluoranthene		170		170
Benzo(a)pyrene		1.7		1.7
Bis (2-ethylhexyl) phthalate	1700	450		450
Chrysene		1700		1700
Dibenzo(a,h)anthracene		1.7		1.7
Fluoranthene	6900			6900
Fluorene	6900			6900
Indeno(1,2,3-cd)pyrene		17		17
Naphthalene	12000			12000
Phenol	190000			190000
Pyrene	5200			5200
INORGANIC COMPOUNDS				
Arsenic	820	120		120
Barium	190000			190000
Cadmium	87	330000		87
Chromium(III)	12000			12000
Chromium(VI)	1700	49000		1700
Mercury	150			150
Nickel (soluble salts)	2100			2100
Zinc	300000			300000

(VALUES ARE IN MG/KG).

(e) **TABLE IV: GENERIC DIRECT-CONTACT SOIL STANDARDS FOR CARCINOGENIC AND NONCARCINOGENIC CHEMICALS OF CONCERN - INDUSTRIAL LAND USE CATEGORY:**
(VALUES IN MG/KG).

CHEMICAL OF CONCERN	SINGLE CHEMICAL NONCARCINOGENS	SINGLE CHEMICAL CARCINOGENS	SOIL SATURATION *	SINGLE CHEMICAL CLEANUP STANDARD
VOLATILE ORGANIC CHEMICALS				
Acetone	14000		62000	14000
Benzene	80	86	1600	80
Carbon Tetrachloride	20	29	2500	20
1,1 Dichloroethane	4200		2600	2600
1,2 Dichloroethane	150	28	2300	28
1,1 Dichloroethene	200	6	3000	6
<i>trans</i> -1,2 Dichloroethene	780		6400	780
<i>cis</i> -1,2 Dichloroethene	360		2600	360
Ethylbenzene	11000		1200	1200
<i>n</i> -Hexane	840		200	200
Methylene Chloride	7100	670	3800	670
Methyl Ethyl Ketone	40000		27000	27000
Methyl Iso-Butyl Ketone	3100		3800	3100
Styrene	20000		1200	1200
Tetrachloroethene (PCE)	430	180	630	180
Toluene	8100		1800	1800
1,1,1-Trichloroethane	6700		2200	2200
Trichloroethene (TCE)	300	400	3500	300
Vinyl Chloride		1.7	2500	1.7
Total Xylenes	12000		1500	1500
SEMI-VOLATILE ORGANIC COMPOUNDS				
Acenaphthene	9900			9900
Anthracene	51000			51000
Benzo(a)anthracene		17		17
Benzo(b)fluoranthene		17		17
Benzo(k)fluoranthene		170		170
Benzo(a)pyrene		1.7		1.7
Bis (2-ethylhexyl) phthalate	1700	450	36000	450
Chrysene		1700		1700
Dibenzo(a,h)anthracene		1.7		1.7
Fluoranthene	6800			6800
Fluorene	6700			6700
Indeno(1,2,3-cd)pyrene		17		17
Naphthalene	10000			10000
Phenol	180000			180000
Pyrene	5100			5100
INORGANIC COMPOUNDS				
Arsenic	680	94		94
Barium	160000			160000
Cadmium	85	180000		85
Chromium(III)	8400			8400
Chromium(VI)	1700	27000		1700
Mercury	150			150
Nickel (soluble salts)	2000			2000
Zinc	280000			280000

* THE SOIL SATURATION CONCENTRATIONS ARE CALCULATED USING THE U.S. EPA RECOMMENDED SOIL SATURATION EQUATION LISTED BELOW. U.S. EPA DOES NOT RECOMMEND USING THIS

EQUATION FOR COMPOUNDS WHICH ARE AT SOLID PHASE AT AMBIENT SOIL TEMPERATURES; THEREFORE, NO GENERIC SOIL SATURATION VALUES WERE CALCULATED FOR INORGANIC COMPOUNDS, POLYCYCLIC AROMATIC HYDROCARBONS, NAPHTHALENE OR PHENOL. THE VOLUNTEER MAY USE THE EQUATION BELOW, ALONG WITH PROPERTY-SPECIFIC INFORMATION, TO CALCULATE A PROPERTY-SPECIFIC SOIL SATURATION CONCENTRATION IN LIEU OF THE GENERIC SOIL SATURATION CONCENTRATIONS LISTED IN TABLES II THROUGH IV OF THIS PARAGRAPH.

- (f) CALCULATING PROPERTY-SPECIFIC SOIL SATURATION CONCENTRATIONS.
- (i) IN LIEU OF USING THE GENERIC SOIL SATURATION CONCENTRATIONS LISTED IN TABLES II THROUGH IV OF THIS PARAGRAPH, THE VOLUNTEER MAY USE THE FOLLOWING EQUATION TO CALCULATE A PROPERTY-SPECIFIC SOIL SATURATION CONCENTRATION:

$$\alpha C_{sat} = \frac{S}{\rho_b} (K_d \rho_b + \theta_w + H' \theta_a)$$

Where:

C_{sat} is the soil saturation concentration (mg/kg)

S is the water solubility (mg/L water)

ρ_b is dry soil bulk density (kg/L)

K_d is the soil-water partition coefficient (L/kg) (default is $K_d = K_{oc} \times f_{oc}$)

K_{oc} is the soil organic carbon/water partition coefficient (L/kg)

f_{oc} is the fraction organic carbon of soil (g/g)

θ_w is the water-filled soil porosity (L_{water}/L_{soil})

H' is the dimensionless Henry's Law constant

θ_a is the air-filled soil porosity (L_{pore}/L_{soil}),

- (ii) THE SOURCE FOR ALL CHEMICAL-SPECIFIC VALUES FOR THE ABOVE EQUATION MUST BE OBTAINED FROM ONE THE FOLLOWING SOURCES:

- (A) U.S. EPA. 1995. TECHNICAL SUPPORT DOCUMENT FOR THE HAZARDOUS WASTE IDENTIFICATION PROGRAM: RISK ASSESSMENT FOR HUMAN AND ECOLOGICAL RECEPTORS, VOLUMES 1 AND 2, RTI, AUGUST 1995; OR

- (B) U.S. EPA. 1995. SUPPLEMENTAL TECHNICAL SUPPORT DOCUMENT FOR THE HAZARDOUS WASTE IDENTIFICATION RULE: RISK ASSESSMENT FOR HUMAN AND ECOLOGICAL RECEPTORS VOLUMES 1 AND 2, RTI, NOVEMBER 1995; AND
- (iii) PHYSICAL VALUES MUST BE OBTAINED FROM ONE OF THE FOLLOWING SOURCES:
- (A) PROPERTY SPECIFIC DATA THAT MEET THE CRITERIA CONTAINED IN PARAGRAPH (D)(3)(b)(iv) OF THE RISK ASSESSMENT RULE; OR
- (B) THE SOIL SATURATION PHYSICAL INPUT DEFAULT VALUES ARE AS FOLLOWS:

P_d (DRY SOIL BULK DENSITY) = 1.5 KG/L
 Θ_w (WATER-FILLED SOIL POROSITY) = 0.15 (UNITLESS)
 F_{oc} (FRACTION ORGANIC CARBON OF SOIL) = 0.006 (UNITLESS)
 Θ_a (AIR-FILLED SOIL POROSITY) = 0.28 (UNITLESS)
 P_s (SOIL PARTICLE DENSITY) = 2.65 KG/L
 N /TOTAL SOIL POROSITY = 0.43 (UNITLESS)

- (g) **TABLE V: THE GENERIC DIRECT-CONTACT STANDARDS FOR POLYCHLORINATED BIPHENYLS (HEREINAFTER "PCBS" OR "PCB") - (VALUES ARE IN MG/KG).**

	RESIDENTIAL LAND USE	COMMERCIAL LAND USE	INDUSTRIAL LAND USE
TOTAL PCBS	1	1	25

THE TOTAL PCB STANDARDS CONTAINED IN THE TABLE ABOVE TAKE INTO ACCOUNT OTHER FACTORS AND ASSUMPTIONS IN ADDITION TO THE CARCINOGENIC OR NONCARCINOGENIC RISK OF THE TOTAL PCBS. THEREFORE, USING THE CUMULATIVE RISK ADJUSTMENT EQUATIONS CONTAINED IN SUBPARAGRAPH (2)(b) OF THIS PARAGRAPH ARE NOT APPROPRIATE AND ARE NOT REQUIRED TO BE PERFORMED; HOWEVER, THE CUMULATIVE RISK

ADJUSTMENT CONDUCTED IN ACCORDANCE WITH SUBPARAGRAPH (2)(b) OF THIS PARAGRAPH MUST BE PERFORMED FOR ALL OTHER CHEMICAL(S) OF CONCERN LISTED IN THE TABLES CONTAINED IN SUBPARAGRAPHS (3)(a)(ii), (3)(c), (3)(d) AND (3)(e) OF THIS PARAGRAPH. THE POINT OF COMPLIANCE IN SUBPARAGRAPH (2)(d) OF THIS PARAGRAPH APPLIES TO PCBS AT A VOLUNTARY PROPERTY.

[COMMENT: THESE VALUES COMPORT WITH THE FEDERAL PCB SPILL CLEANUP POLICY. FOR COMMERCIAL OR RESIDENTIAL LAND USES, THE PCB SPILL CLEANUP POLICY DOES ALLOW FOR 10 PPM OF TOTAL PCBS TO REMAIN AT THE PROPERTY, SO LONG AS A MINIMUM OF 10 INCHES OF SOIL COVER NOT EXCEEDING 1 PPM TOTAL PCBS IS MAINTAINED ON THE PROPERTY. THIS HIGHER CLEANUP LEVEL REQUIRES PROPER OPERATION AND MAINTENANCE OF THE SOIL COVER AND THEREFORE WOULD REQUIRE THE VOLUNTEER TO FOLLOW THE PROCEDURES OF A PROPERTY-SPECIFIC RISK ASSESSMENT, UNDER THE RISK ASSESSMENT RULE INSTEAD OF THE PROCEDURES UNDER THIS RULE.]

(h) **TABLE VI: THE GENERIC DIRECT-CONTACT STANDARDS FOR LEAD (VALUES ARE IN MG/KG).**

	<u>RESIDENTIAL</u> <u>LAND USE</u>	<u>COMMERCIAL</u> <u>LAND USE</u>	<u>INDUSTRIAL</u> <u>LAND USE</u>
<u>LEAD</u>	400	1200	2800

THESE LEAD STANDARDS CONTAINED IN THE TABLE ABOVE TAKE INTO ACCOUNT OTHER FACTORS AND ASSUMPTIONS IN ADDITION TO THE CARCINOGENIC OR NONCARCINOGENIC RISK OF LEAD. THEREFORE, USING THE CUMULATIVE RISK ADJUSTMENT EQUATIONS CONTAINED IN SUBPARAGRAPH (2)(b) OF THIS PARAGRAPH ARE NOT APPROPRIATE AND ARE NOT REQUIRED TO BE PERFORMED; HOWEVER, THE CUMULATIVE RISK ADJUSTMENT CONDUCTED IN ACCORDANCE WITH SUBPARAGRAPH (2)(b) OF THIS PARAGRAPH MUST BE PERFORMED FOR ALL OTHER CHEMICALS OF CONCERN LISTED IN THE TABLES CONTAINED IN SUBPARAGRAPHS (3)(a)(ii), (3)(c), (3)(d) AND (3)(e) OF THIS PARAGRAPH. THE POINT OF COMPLIANCE IN SUBPARAGRAPH

(2)(d) OF THIS PARAGRAPH APPLIES TO LEAD AT A VOLUNTARY PROPERTY.

(4) APPLICABLE STANDARDS.

APPLICABLE STANDARDS FOR THE DIRECT-CONTACT SOILS ON THE PROPERTY ARE MET IF:

- (a) THE CONCENTRATION OF ANY CHEMICAL OF CONCERN IN THE SURFACE SOILS ON THE PROPERTY, AS DETERMINED IN ACCORDANCE WITH PARAGRAPH (G)(4) OF THE PHASE II RULE, MEETS THE GENERIC DIRECT-CONTACT SOIL STANDARD CONCENTRATION(S) SET FORTH IN PARAGRAPH (B)(3) OF THIS RULE AND IS CONSISTENT WITH THE ASSUMPTIONS SET FORTH IN PARAGRAPH (B)(2)(b) OF THIS RULE FOR THE INTENDED LAND USE; OR
- (b) ANY CHEMICAL(S) OF CONCERN IN THE SURFACE SOILS ON THE PROPERTY ARE WITHIN BACKGROUND LEVELS AS DETERMINED IN ACCORDANCE WITH PARAGRAPH (J) OF THE PHASE II RULE.

(5) IMPLEMENTATION OF REMEDY.

A REMEDY MUST BE IMPLEMENTED IN ACCORDANCE WITH THE REMEDY RULE IF THE CONCENTRATION OF ANY CHEMICAL(S) OF CONCERN IN THE SURFACE SOILS ON THE PROPERTY EXCEEDS THE APPLICABLE STANDARDS AS DESCRIBED IN PARAGRAPH (B)(4) OF THIS RULE. A REMEDY MUST LIMIT OR PREVENT EXPOSURE TO ANY CHEMICAL OF CONCERN(S) IF THEY REMAIN ON THE PROPERTY, OR REDUCE THE CONCENTRATION OF ANY CHEMICAL(S) OF CONCERN TO LEVELS AT OR BELOW APPLICABLE STANDARDS.

[COMMENT: OTHER OBLIGATIONS TO ADDRESS SOIL MEDIA MAY EXIST IN ADDITION TO THE OBLIGATION TO ADDRESS DIRECT-CONTACT WITH SOILS. WHEN THE GROUNDWATER CLASSIFICATION RULE (RULE 3745-300-10 OF THE ADMINISTRATIVE CODE) REQUIRES THAT THE LEACHING OF HAZARDOUS SUBSTANCES AND PETROLEUM FROM SOIL TO GROUND WATER BE CONTROLLED AND IT IS DETERMINED AS A RESULT OF A PHASE II PROPERTY ASSESSMENT THAT HAZARDOUS SUBSTANCES AND PETROLEUM ARE LEACHING OR WILL LEACH TO GROUND WATER, THE

VOLUNTEER MUST DETERMINE AN APPLICABLE STANDARD IN ACCORDANCE WITH PARAGRAPH (D)(3) OF THE RISK ASSESSMENT RULE. THE VOLUNTEER MAY DEVELOP PROPERTY-SPECIFIC VALUES THAT CONTROL LEACHING, IN ACCORDANCE WITH THE RISK ASSESSMENT RULE OR MAY USE THE CHEMICAL-SPECIFIC LEACH BASED VALUES CONTAINED IN THE GUIDANCE DOCUMENT, "OHIO EPA DERIVED LEACH-BASED VALUES," JULY, 1996, WHICH PREVENT LEACHING ABOVE THE GENERIC POTABLE GROUND WATER STANDARDS. THESE VALUES MAY BE USED ALONE OR, AS APPROPRIATE, IN CONCERT WITH ADDITIONAL FATE AND TRANSPORT MODELS IN ACCORDANCE WITH THE RISK ASSESSMENT RULE. THE "OHIO EPA DERIVED LEACH-BASED VALUES," JULY, 1996, GUIDANCE DOCUMENT IS AVAILABLE UPON REQUEST FROM THE OHIO EPA, DIVISION OF EMERGENCY AND REMEDIAL RESPONSE.

ADDITIONALLY, IN CIRCUMSTANCES WHERE THE PHASE II PROPERTY ASSESSMENT REVEALS THE PRESENCE OF GROSS CONTAMINATION, THE VOLUNTEER MUST ADDRESS THE SITUATION IN ACCORDANCE WITH THE REMEDIATION RULE (RULE 3745-300-15 OF THE ADMINISTRATIVE CODE).]

(C) GENERIC POTABLE GROUND WATER STANDARDS.

(1) APPLICABILITY.

- (a) THE GENERIC POTABLE GROUND WATER STANDARDS CONTAINED IN SUBPARAGRAPH (3) OF THIS PARAGRAPH APPLY AS DETERMINED IN ACCORDANCE WITH THE GROUND WATER CLASSIFICATION RULE.
- (b) IF THE GROUND WATER UNDERLYING THE PROPERTY IS USED FOR ACTIVITIES OTHER THAN DRINKING, SHOWERING, BATHING OR COOKING, AND EXPOSURES ARE REQUIRED TO BE EVALUATED UNDER THE GROUND WATER CLASSIFICATION RULE, A PROPERTY-SPECIFIC RISK ASSESSMENT MUST BE CONDUCTED FOLLOWING THE PROCEDURES ESTABLISHED IN THE RISK ASSESSMENT RULE, TO DETERMINE APPLICABLE STANDARD(S) FOR THE INTENDED USE OF THE SATURATED ZONE(S) UNDERLYING THE PROPERTY.

[COMMENT: BECAUSE MANY OF THE GENERIC POTABLE GROUND WATER STANDARDS IN TABLE VII OF THIS RULE ARE

MAXIMUM CONTAMINANT LEVELS (MCLS) WHICH TAKE INTO ACCOUNT OTHER FACTORS AND ASSUMPTIONS IN ADDITION TO THE CARCINOGENIC AND NONCARCINOGENIC RISK OF THE CHEMICAL, CUMULATIVE RISK ADJUSTMENTS ARE NOT APPROPRIATE. THEREFORE, THE "CLEANUP STANDARD" COLUMN IN TABLE VII OF THIS RULE CONTAINS THE APPLICABLE GENERIC POTABLE GROUND WATER STANDARDS FOR EACH CHEMICAL OF CONCERN FOR THE PROPERTY REGARDLESS OF THE NUMBER OF CHEMICAL(S) OF CONCERN IDENTIFIED IN THE GROUND WATER UNDERLYING THE PROPERTY.]

- (c) THE GENERIC POTABLE GROUND WATER STANDARDS FOR PETROLEUM AT COMMERCIAL OR RESIDENTIAL PROPERTIES ARE THE STANDARDS ESTABLISHED IN THE RULES ADOPTED UNDER SECTIONS 3737.88 AND 3737.882 OF THE REVISED CODE, WHICH ARE CURRENTLY SET FORTH IN CHAPTER 1301:7-9-13 OF THE ADMINISTRATIVE CODE.
 - (d) A PROPERTY-SPECIFIC RISK ASSESSMENT CONDUCTED IN ACCORDANCE WITH THE PROCEDURES ESTABLISHED IN RULE 3745-300-09 OF THE ADMINISTRATIVE CODE, MUST BE EMPLOYED IF THE CHEMICAL(S) OF CONCERN ON THE PROPERTY ARE NOT LISTED IN TABLE VII OF THIS RULE.
 - (e) IF INSTITUTIONAL OR ENGINEERING CONTROLS ARE USED TO MEET APPLICABLE STANDARDS FOR THE GROUND WATER UNDERLYING OR EMANATING FROM THE PROPERTY, A PROPERTY-SPECIFIC RISK ASSESSMENT MUST BE CONDUCTED FOLLOWING THE PROCEDURES ESTABLISHED IN THE RISK ASSESSMENT RULE TO DEMONSTRATE THAT APPLICABLE STANDARDS HAVE BEEN MET FOR THE GROUND WATER UNDERLYING OR EMANATING FROM THE PROPERTY.
- (2) ASSUMPTIONS.
- THE GENERIC POTABLE GROUND WATER STANDARDS CONTAINED IN TABLE VII AT SUBPARAGRAPH (3)(c) OF THIS PARAGRAPH WERE CALCULATED USING THE ASSUMPTION THAT THE GROUND WATER UNDERLYING THE PROPERTY WILL BE USED AS A SOURCE OF WATER FOR DRINKING, COOKING, SHOWERING OR BATHING.
- (3) THE GENERIC POTABLE GROUND WATER STANDARDS.

- (a) THE GENERIC POTABLE GROUND WATER STANDARDS FOR PETROLEUM, FOR RESIDENTIAL AND COMMERCIAL PROPERTIES ARE CONTAINED IN SUBPARAGRAPH (1)(c) OF THIS PARAGRAPH.
- (b) THE VOLUNTEER SHOULD CONTACT THE CERTIFIED LABORATORY THAT IS CONDUCTING ANALYSES IN SUPPORT OF THE VOLUNTARY ACTION TO DETERMINE IF THE CLEANUP STANDARDS CONTAINED IN TABLE VII OF THIS RULE ARE WITHIN THE LABORATORY'S REPORTING LIMITS. THE VOLUNTEER MUST DETERMINE THAT THE CERTIFIED LABORATORY, WHICH PERFORMS ANALYSES WHICH FORMS THE BASIS FOR THE ISSUANCE OF A NO FURTHER ACTION LETTER, IS CAPABLE OF DETECTING THE CHEMICAL(S) OF CONCERN ON THE PROPERTY AT OR BELOW THE APPLICABLE GENERIC POTABLE GROUND WATER STANDARDS.

(c) **TABLE VII: GENERIC POTABLE GROUND WATER STANDARDS (VALUES IN $\mu\text{G/L}$, OR MICROGRAMS PER LITER).**

CHEMICAL OF CONCERN	NONCARCINOGENS	CARCINOGENS	MCL	CLEANUP STANDARD
VOLATILE ORGANIC CHEMICALS				
1,1,1-Trichloroethane			200 0	200 0
1,1,2-Trichloroethane			5 0	5 0
1,1-Dichloroethylene			7 0	7 0
1,2,4-Trichlorobenzene			70 0	70 0
1,2-Dichloroethane			5 0	5 0
1,2-Dichloropropane			5 0	5 0
Benzene			5 0	5 0
Carbon Tetrachloride			5 0	5 0
cis-1,2 Dichloroethene			70 0	70 0
Dichloromethane			5 0	5 0
Ethylbenzene			700 0	700 0
Methyl Ethyl Ketone	8600 0			8600 0
Monochlorobenzene			100 0	100 0
n-Hexane	840 0			840 0
o-Dichlorobenzene			600 0	600 0
para-Dichlorobenzene			75 0	75 0
Styrene			100 0	100 0
Tetrachloroethene (PCE)			5 0	5 0
Toluene			1000 0	1000 0
Total Xylenes			10000 0	10000 0
trans-1,2 Dichloroethene			100 0	100 0
Trichloroethene (TCE)			5 0	5 0
Vinyl Chloride			2 0	2 0
SEMI-VOLATILE ORGANIC COMPOUNDS				
Naphthalene	570 0			570 0
Phenol	9400 0			9400 0
INORGANIC COMPOUNDS				
Antimony			6 0	6 0
Arsenic			50 0	50 0
Asbestos			7*	7*
Barium			2000 0	2000 0
Beryllium			4 0	4 0
Cadmium			5 0	5 0
Chromium			100 0	100 0
Cyanide			200 0	200 0
Fluoride			4000 0	4000 0
Mercury			2 0	2 0
Nickel (soluble salts)			100 0	100 0
Nitrate (as N)			10000 0	10000 0
Nitrate-Nitrite (as N)			10000 0	10000 0
Nitrite (as N)			1000 0	1000 0
Selenium			50 0	50 0
Thallium			2 0	2 0
Zinc	4700 0			4700 0
PESTICIDES AND OTHER ORGANIC CHEMICALS (SOCs)				
2,3,7,8-TCDD (Dioxin)			0 0	0 0
2,4,5-TP (Silvex)			50 0	50 0
2,4-D			70 0	70 0
Alachlor			2 0	2 0
Atrazine			3 0	3 0
Benzo(a)pyrenes			0 2	0 2
Carbofuran			40 0	40 0
Chlordane			2 0	2 0
Dalapon			200 0	200 0
Di(2-ethylhexyl)adipate			400 0	400 0
Di(2-ethylhexyl)phthalate			6 0	6 0

(d) POINT OF COMPLIANCE.

THE POINT OF COMPLIANCE FOR THE GENERIC POTABLE GROUND WATER STANDARDS CONTAINED IN THIS PARAGRAPH MUST BE DETERMINED IN ACCORDANCE WITH RULE 3745-300-10 OF THE ADMINISTRATIVE CODE, THE GROUND WATER CLASSIFICATION RULE.

(e) APPLICABLE STANDARD.

APPLICABLE STANDARDS FOR POTABLE GROUND WATER ARE:

- (i) THE CONCENTRATION OF ANY CHEMICAL(S) OF CONCERN IN THE GROUND WATER ON THE PROPERTY, AS DETERMINED IN ACCORDANCE WITH THE PHASE II RULE MEET THE GENERIC POTABLE GROUND WATER STANDARD CONCENTRATION SET FORTH IN SUBPARAGRAPH (3) OF THIS PARAGRAPH.
- (ii) THE CONCENTRATIONS OF ANY CHEMICAL(S) OF CONCERN IN THE GROUND WATER ON THE PROPERTY ARE DETERMINED TO BE WITHIN BACKGROUND LEVELS, AS DETERMINED IN ACCORDANCE WITH PARAGRAPH (J) OF THE PHASE II RULE, IF THE BACKGROUND CONCENTRATIONS OF ANY CHEMICAL(S) OF CONCERN ARE HIGHER THAN THE GENERIC POTABLE GROUND WATER STANDARD;
- (f) IF THE CONCENTRATION OF ANY CHEMICAL(S) OF CONCERN IN THE GROUND WATER UNDERLYING THE PROPERTY OR EMANATING FROM THE PROPERTY EXCEEDS THE GENERIC POTABLE GROUND WATER STANDARD CONCENTRATIONS AT PARAGRAPH (C)(3) OF THIS RULE, A REMEDY MUST BE IMPLEMENTED IN ACCORDANCE WITH THE REMEDY RULE TO EITHER LIMIT OR PREVENT EXPOSURE TO ANY CHEMICAL(S) OF CONCERN THAT REMAIN ON THE PROPERTY, OR TO REDUCE THE CONCENTRATION OF ANY CHEMICAL(S) OF CONCERN TO THE GENERIC POTABLE GROUND WATER STANDARD CONCENTRATIONS LISTED IN SUBPARAGRAPH (3) OF THIS PARAGRAPH, IN ORDER TO MEET THE APPLICABLE STANDARD IN ACCORDANCE WITH THE REMEDIATION RULE.

(D) GENERIC STANDARDS FOR SURFACE WATER.

- (1) ALL POINT SOURCE DISCHARGES OF POLLUTANTS INTO THE SURFACE WATERS OF THE STATE, AS DEFINED IN SECTION 6111 01

OF THE REVISED CODE, AND ANY OTHER REGULATED DISCHARGES THAT OCCUR FROM OR ON THE PROPERTY MUST COMPLY WITH ALL PERMIT OR OTHER APPLICABLE REQUIREMENTS OF THE FEDERAL WATER POLLUTION CONTROL ACT AND CHAPTER 6111. OF THE REVISED CODE, AND ANY REGULATIONS ADOPTED THEREUNDER.

[COMMENT: A VOLUNTEER MAY OBTAIN A CONSOLIDATED STANDARDS PERMIT FOR ACTIVITIES CONDUCTED IN CONNECTION WITH A VOLUNTARY ACTION WHICH REQUIRE PERMITS FROM THE DIRECTOR.]

- (2) STORM WATER ASSOCIATED WITH INDUSTRIAL ACTIVITY THAT IS DISCHARGED TO THE SURFACE WATERS OF THE STATE OR IS DISCHARGED THROUGH A SEPARATE MUNICIPAL STORM SEWER SYSTEM, MUST COMPLY WITH THE APPLICABLE REQUIREMENTS CONTAINED IN 40 CFR 122.26.

- (E) GENERIC NUMERICAL STANDARDS FOR SEDIMENT (RESERVED).
- (F) GENERIC NUMERICAL SOIL STANDARDS FOR PROTECTION OF ECOLOGICAL RECEPTORS (RESERVED).

EFFECTIVE: _____

CERTIFICATION: _____

DATE: _____

PROMULGATED UNDER: RC CHAPTER 119.

RULE AMPLIFIED: RC CHAPTER 3746.

RULE AUTHORIZED BY: RC CHAPTER 3746.

PRIOR EFFECTIVE DATES: NONE